



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.      | CONFIRMATION NO. |
|--|-------------|----------------------|--------------------------|------------------|
| 10/557,850   | 11/21/2005  | Masatoshi Shimoda    | 280847US2PCT             | 7919             |
| 22850 7590 01/05/2007<br>OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.<br>1940 DUKE STREET<br>ALEXANDRIA, VA 22314 |             |                      | EXAMINER<br>TRAN, BINH Q |                  |
|  |             |                      | ART UNIT<br>3748         | PAPER NUMBER     |
| SHORTENED STATUTORY PERIOD OF RESPONSE   |             |                      | MAIL DATE                | DELIVERY MODE    |
| 3 MONTHS   |             |                      | 01/05/2007               | PAPER            |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/557,850

Applicant(s)

SHIMODA, MASATOSHI

Examiner

BINH Q. TRAN

Art Unit

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,7,9,11,13,15,17,19,21,23,25,29,31 and 33-35 is/are rejected.
- 7) ☒ Claim(s) 2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 11/21/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

*Claims 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, and 33-35 are rejected under 35 U.S.C. 102 (b) as being anticipated by Penetrante et al. (Penetrante) (Patent Number 6,038,854).*

Regarding claim 1, Penetrante discloses an exhaust emission control device (e.g. 16, 150, 136) with a post-processing device for allowing exhaust gas to pass therethrough for gas

Art Unit: 3748

purification incorporated in an exhaust pipe of an internal combustion engine (14), comprising a plasma generator (e.g. 50; 120; 142; 162) arranged upstream of the post-processing device for discharging electricity into the exhaust gas to generate plasma, flow-through type oxidation catalyst arranged upstream of the plasma generator, fuel adding means (54) arranged upstream of the oxidation catalyst (e.g. 50, 78, 82) for adding fuel in the exhaust gas and temperature increasing means for increasing exhaust temperature to a level enough for oxidation reaction on the oxidation catalyst of the fuel added by the fuel adding means (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 3, Penetrante further discloses that wherein fuel adding means is fuel injection control means which causes the fuel injection unit to conduct post-injection followed by the main injection and with non-ignition timing later than a compressive top dead center (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 5, Penetrante further discloses that wherein the temperature increasing means for increasing the exhaust temperature is suction throttling means for properly throttling suction flow rate (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 7, Penetrante further discloses that wherein the temperature increasing means for increasing the exhaust temperature is suction throttling means for properly throttling suction flow rate (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 9, Penetrante further discloses that wherein the temperature increasing means for increasing the exhaust temperature is fuel injection controlling means for causing the fuel injection unit to conduct main injection delayed within a combustible range to the normal injection (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 11, Penetrante further discloses that wherein the temperature increasing means for increasing the exhaust temperature is fuel injection controlling means for causing the fuel injection unit to conduct main injection delayed within a combustible range to the normal injection (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 13, Penetrante further discloses that wherein the temperature increasing means for increasing the exhaust temperature is fuel injection controlling means for causing the fuel injection unit to conduct post injection with a combustible timing just after the main injection (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 15, Penetrante further discloses that wherein the temperature increasing means for increasing the exhaust temperature is fuel injection controlling means for causing the fuel injection unit to conduct post injection with a combustible timing just after the main injection (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 17, Penetrante further discloses judging means for determining whether fuel addition is required or not through monitoring at least either of current and voltage upon generation of plasma in the plasma generator (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 19, Penetrante further discloses that the judging means for determining whether fuel addition is required or not through monitoring at least either of current and voltage upon generation of plasma in the plasma generator (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 21, Penetrante further discloses that the judging means for determining whether fuel addition is required or not through monitoring at least either of current and voltage

Art Unit: 3748

upon generation of plasma in the plasma generator (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 23, Penetrante further discloses that the judging means for determining whether fuel addition is required or not through monitoring at least either of current and voltage upon generation of plasma in the plasma generator (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 25, Penetrante further discloses that the judging means for determining whether fuel addition is required or not through monitoring at least either of current and voltage upon generation of plasma in the plasma generator (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 27, Penetrante further discloses that the judging means for determining whether fuel addition is required or not through monitoring at least either of current and voltage upon generation of plasma in the plasma generator (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 29, Penetrante further discloses that the judging means for determining whether fuel addition is required or not through monitoring at least either of current and voltage upon generation of plasma in the plasma generator (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 31, Penetrante further discloses that the judging means for determining whether fuel addition is required or not through monitoring at least either of current and voltage upon generation of plasma in the plasma generator (See Figures 1-12; col. 5, lines 60-67; col. 6-7, lines 1-67).

Regarding claim 33, Penetrante discloses an exhaust emission control device (e.g. 16, 150, 136) with a catalyst (e.g. 50, 78, 82) regenerative particulate filter (122, 150) as a post-processing device incorporated into an exhaust pipe, comprising NOX reduction catalyst arranged downstream of the particulate filter for reductive purification of NO, in exhaust gas and a plasma generator (e.g. 50; 120; 142; 162) arranged upstream of the particulate filter for discharging electricity into the exhaust gas to generate plasma, said plasma generator being constructed to be actuated in an operating status with lower exhaust temperature (See Figures 1-12; col. 13, lines 15-67; col. 14-15, lines 1-67; col. 16, lines 1-15).

Regarding claim 34, Penetrante further discloses a temperature sensor for detecting exhaust temperature and a controller for causing the plasma generator to be actuated on the basis of a detection signal from the temperature sensor and when the exhaust temperature is below a predetermined value (See Figures 1-12; col. 13, lines 15-67; col. 14-15, lines 1-67; col. 16, lines 1-15).

Regarding claim 35, Penetrante further discloses that the controller is constructed such that a generated plasma amount is optimized upon actuation of the plasma generator and depending upon the exhaust temperature (See Figures 1-12; col. 13, lines 15-67; col. 14-15, lines 1-67; col. 16, lines 1-15).

***Allowable Subject Matter***

Claims 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Since allowable subject matter has been indicated, applicant is encouraged to submit ***Final Formal Drawings (If Needed)*** in response to this Office action. The early submission of formal drawings will permit the Office to review the drawings for acceptability and to resolve any informalities remaining therein before the application is passed to issue. This will avoid possible delays in the issue process.

***Prior Art***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of five patents:

Takeshima et al. (Pat. No. 56955041), Twigg (Pat. No. 6775972), Nakanishi et al. (Pat. No. 7043902), Birckigt et al. (Pat. No. 6938409), and Taylor, III et al. (Pat. No. 6959542) all disclose an exhaust gas purification for use with an internal combustion engine.



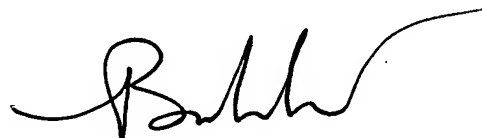
*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Binh Tran whose telephone number is (571) 272-4865. The examiner can normally be reached on Monday-Friday from 8:00 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reach on (571) 272-4859. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BT  
December 22, 2006



Binh Q. Tran  
Patent Examiner  
Art Unit 3748